

Book Review

A review of *Laser-Tissue Interactions—Fundamental and Applications* by Markolf H. Niemz. ISBN 3-540-60363-8. Springer-Verlag, Berlin, 297 pp. with 165 figures and 33 tables

Dr. Niemz's new book takes on a formidable challenge, to summarize the current status and developments in the field of laser tissue interaction and its immediate derivative, the application of lasers to the field of medicine and biology. With an excellent background in bioengineering and biomedical optics, the author is well qualified for the task. Indeed, the author has provided a comprehensive background with examples describing the basics of laser-tissue interaction.

The book begins with a general description of the basic phenomena governing the work in the field, namely, the fundamentals involving the interaction of light and matter. This description supplies some basic concepts and definitions so that even those less familiar with the subject can comprehend much of what follows. This section includes discussions of reflection, absorption, scattering, and light propagation in turbid media photon transport theory. It also includes a very useful and easy-to-follow introductory discussion of technique for measurement of tissue optical properties.

The subsequent section discusses the basic mechanisms and interaction processes between laser

light and tissue. Photochemical interaction, thermal interaction, photoablation, plasma-mediated interaction, and photodisruption are all discussed in sufficient detail to allow new students in the field comprehensive understanding of the subject matter and to those familiar with the basic concept, sufficient details to make the book an extremely useful reference companion.

The third section describes in considerable detail many specific uses of current laser technologies in the rapidly evolving fields of application such as ophthalmology, dentistry, dermatology, and orthopedics. This section is very useful for both clinicians wishing to keep themselves updated on recent technical developments and basic scientists and engineers interested in the specific details of how evolving electro-optical technologies are applied to specific problems in medicine. Many of the examples are discussed in detail and provide many references and documentation that can then serve to introduce and orient a researcher or practicing physician undertaking a new, detailed involvement in one of these fields.

Finally, the last section dealing with laser safety is of significant interest to all segments of the scientific biomedical population where the rapidly increasing use of lasers is creating new hazardous situations for researcher, clinicians, and patients and must be carefully considered and addressed before lasers become practical and widespread tools in medicine.

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